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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,084	04/19/2004	Wood-Hi Cheng	LELI 3515	1864
321	7590	01/25/2006	EXAMINER	
SENNIGER POWERS ONE METROPOLITAN SQUARE 16TH FLOOR ST LOUIS, MO 63102			PETKOVSEK, DANIEL J	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/827,084

Applicant(s)

CHENG ET AL.

Examiner

Daniel J. Petkovsek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on FRPR filed August 23, 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Drawings*

2. The drawings filed April 19, 2004 are acknowledged.

### *Claim Objections*

3. Claim 2 is objected to because of the following informalities: "washed" is not used in step (b), it should be replaced by "cleaned". Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Le Bris U.S.P. No. 5,595,669, and further in view of Bonham et al. U.S.P. No. 5,800,666.

Le Bris U.S.P. No. 5,595,669 teaches (Figs. 3, 4; column 2, line 21 through column 4, line 3) a method for fabricating an optical lens shape on the end of a fiber, comprising: fixing

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fibers F1-F6 into a holder 2, immersing the fiber into a container 6 in which the fiber(s) are etched to form a cone shape (see Figs), then moving the fiber(s) into the path of an electric arcs E1, E2 to melt the cone and form the fiber lens, in which adjustment of the relative position between the electric arcs and the cone shape to form a desired curvature is controlled by the apparatus shown in Fig. 4.

Le Bris '669 does not **explicitly** teach that the fiber is stripped of a coating and cleaned before fixed in the holder (claimed method steps (a), (b)); that a ferrule is used; or that the etch composition contains a solution of hydrofluoride (HF), a layer of oil, and a middle mixed layer (step (d)).

Bonham et al. U.S.P. No. 5,800,666 teaches (column 2, lines 8-28) methods for fabricating fiber lenses (see column 1, line 65 through column 2, line 28) that comprise stripping an optical fiber of a coating layer for the purpose of removing a protective coating when the fiber is ready for the etching process, in which the etchant is comprised of HF, an oil layer, and a middle mixed layer (see Summary). It is noted that a person having ordinary skill in the art at the time the invention was made would have recognized that cleaning the fiber after stripping (and the use of acetone, alcohol, and deionized water), if not inherently done, would have been an obvious step in the art in order to remove any material that may later alter optical coupling functionality. Official notice is taken as to the obviousness of cleaning a fiber (and the material used to clean it (see claim 2)) in between the steps of stripping it and etching it.

Since Le Bris '669 and Bonham et al. '666 are both from the same field of endeavor, the purpose disclosed by Bonham et al. '666 would have been recognized in the pertinent art of Le Bris '669.

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It would have been obvious at the time the invention was made to a person having ordinary skill in the art to infer each of the method steps as claimed as being obvious in view of the combination of Le Bris '669 and Bonham et al. '666, for the purpose of explaining each and every method step that goes into the formation of a functional optical fiber lens, although some steps may have been left out by Le Bris '669 since they were non-critical to the disclosure. In particular, the Examiner points Applicant to Bonham et al. '666 (column 2, lines 8-28) for reference to a method that Applicant believes is lacking in the prior art (specification [0003]).

The limitation of having a ferrule included in the holder is one of obvious design choice to a person having ordinary skill in the art at the time the invention was made. Ferrules are well known in the art to hold optical fibers when it is necessary to hold the fiber in a stable position, and a person having ordinary skill in the art would have recognized that the holder of Le Bris '669 solves any stated problem or is for the same particular purpose of a ferrule and it appears that the invention would perform equally well with a holder as it would with a ferrule surrounding the fiber. Regarding claims 3 and 14, for a ferrule to properly hold a fiber, it is necessary that it hold the fiber in a snug fit (the inner radius matches the outside of the fiber), and further, the composition (ceramic) of the ferrule is non-critical to the invention.

Regarding claim 5, the etchant can be 48% HF (see column 3, lines 19-21 of Bonham et al. '666).

Regarding claim 6, the minimum etch time of Bonham et al. '666 is between 30-50 minutes (column 5, lines 50-55).

Regarding claim 10, there is no offset, so it is less than 1  $\mu\text{m}$ .

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Regarding claim 13, the lens can be hemispherical (column 2, lines 13-15, Bonham et al. '666), or hyperbolic (see detailed description).

Regarding claims 4, 7-9, and 11, these limitations are all obvious design choices for parameters that are workable ranges (oil thickness and composition (claims 4 and 11); cone to arc distance (claims 7 and 8); and the radius of the curvature of the lens (claim 9)) in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to come up with these workable ranges for etching the fiber(s), since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

### *Conclusion*


6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, with respect to the state of the art of making fiber lenses using both etching and melting by electric arc: PTO-892 form references C-E.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Petkovsek whose telephone number is (571) 272-2355. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Daniel Petkovsek  
January 12, 2006

  
AKM ENAYET ULLAH  
PRIMARY EXAMINER